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AUTHOR Nieman, Ronald H.; Gastright, Joseph F.
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PRESCHOOL PLUS ALL-DAY-KINDERGARTEN: THE CUMULATIVE EFFECTS OF EARLY CHILDHOOD PROGRAMS ON THE COGNITIVE GROWTH OF FOUR AND FIVE YEAR OLD CHILDREN

Ronald H. Nieman and Joseph F. Gastright, Cincinnati Public Schools

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Empirical longitudinal evidence is presented regarding the positive relationship between test scores and the amount of time students participate in preschool and kindergarten classes. These findings are based upon four years of observations with five different standardized tests. This positive relationship exists independent of a wide range of teaching styles, materials, and methodologies. Results show significant differences in I.Q., readiness, and achievement at the end of preschool, kindergarten, first, and second grade. Three treatment groups are identified: children that have had preschool and all-day-kindergarten, those having preschool and half-day-kindergarten, and those that have half-day-kindergarten alone.

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Objectives

The objective of this paper is to report the differential effects upon the cognitive growth of educationally needy four and five year old children with regard to the amount of time spent in preschool and/or kindergarten classes. It is the contention of this paper that four and five year old students, regardless of the philosophy underlying the treatment, will respond positively to any intelligently organized, purposeful early childhood class. The project described is the ESEA Title I Early Childhood Project in the Cincinnati Public Schools. Its primary objective is to facilitate the development of vocabulary and reading readiness, and reading levels in grade one will be approximately equal to national averages. Other objectives include the development of desirable social skills, health habits, self concepts, and meaningful parent involvement.

Perspectives

Research has established that extended preschool intervention can significantly improve the I.Q. of disadvantaged children (Kirk, 1958). Some researchers report that early home intervention can even produce immediate, if irregular, results (Klaus and Gray, 1968). Conflicting reports, however, regarding the benefits of particular approaches to early childhood education have appeared continuously in the literature (Hechinger, 1966). Even among the first theorists and practitioners of early childhood education, there was little agreement upon the nature of a kindergarten. The philosophies of early European and North American educators like Friedrich Froebel, Elizabeth Peabody, and Kate Douglass Wiggin were

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often in disagreement with somewhat later educators like Marie Montessori and John Dewey (Baylor, 1965; Dewey, 1966; Montessori, 1964; Wiggin, 1893).

Although the disagreements continue into the present, everyone who has any positive feelings regarding the early childhood education believes that educating the very young is probably one of the wisest investments available to a school system (Weber, 1969). Cities like Cincinnati and San Francisco have been proponents of early childhood education since the 1870's (Weber, 1969).

Today, virtually all large cities have growing kindergarten programs. With growing dollar amounts being invested, researchers are asked to find the "best approach." Is there even a "better approach?" Probably, but consider the somewhat surprising impact of treatments like "Sesame Street." Implementation, interpretation, and application of these programs by parents and teachers are probably unlimited in scope, yet the social and cognitive development of its viewers were improved (Ball, 1970). Some studies (Goulet, 1974) present strong reasons to believe that the amount of time in school and CA are positively related to MA.

Methods

The data in this report are compiled from two sources: project year evaluation reports of the Cincinnati Early Childhood Component of the ESEA Title I program, and a post-hoc follow-up study of children in these programs at the end of the second grade.

There are four discrete treatment groups determined by the type and length of student involvement in class:

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Group	Hours of Available Class Time
1. Preschool (PS) (age 4)	600
2. Half-Day-Kindergarten (½DK) (age 5)	600
3. All-Day-Kindergarten (ADK) (age 5)	1,200
4. All-Day-Kindergarten + Preschool (ADK+PS) (age 5)	1,800

Selection of students through school year 1972-73 was based upon three criteria: residency in a Title I school district, an apparent need for an enriched early childhood experience, and the willingness of the parents to have their child participate in preschool or all-day-kindergarten, both of which are optional in Ohio. Beginning with school year 1973-74, however, the "apparent need" was replaced with a "tested need." In effect, this meant that every four and five year old residing in a Title I school district was given the opportunity to be screened with the Cooperative Preschool Inventory; only those scoring at or below the third stanine were considered eligible.

The data were analyzed by one-way ANOVA. No covariate, multivariate, matching, or leveling procedures were used since the project administrators were primarily interested in an evaluation of the program.

Project Description

To be eligible for the Title I Early Childhood Project, a child must reside in a Title I area and score at or below the third stanine of the Cooperative Preschool Inventory (ETS). Preschool children must be four years old and kindergarteners must be five on or before September 30.

Preschool children attend a three hour morning or afternoon session five days a week; kindergarten students attend all day, six hours each day, five days each week; There are twenty-two schools that have both preschool (PS)

and all-day-kindergarten (ADK), with a combined staff total of fifty-one teachers and fifty-one aides. Class size is approximately 15 for preschool and 23 for all-day-kindergarten. Lunch and snacks are provided by the project.

While there are certain basic underlying instructional philosophies for the Title I Early Childhood Project in Cincinnati, there are enough different materials, approaches, and personalities to contradict a claim that there is a single, identifiable treatment, except for the fact that kindergarten is extended for a full day, and that a preschool is provided. There is simply more time, and with an instructional aide in every class, more attention provided. Published materials commonly used include Sullivan, Peabody, Lavetelli, and Lippincott which are also used in many traditional kindergartens. Further, a wide range of theoretical interpretation and implementation of the above materials exists among the 102 teachers and aides who work in the program. Staff age ranges from early 20's to late 60's. The important point is that whatever characteristic nature the class assumes, the ADK teacher and aide have more time to spend with their children than the traditional half-day-kindergarten ($\frac{1}{2}$DK) teachers. In addition, most ADK students have typically the benefit of attending preschool in the same building the year before.

Data Source

All children reside in the Title I area of the Cincinnati Public Schools. To be considered a Title I area, at least forty percent of the school age children of an individual school district must be members of a low-income family. Further, as explained earlier, only children scoring in the lower three stanines of a standardized test are eligible for Title I service; approximately seventy-five percent of the children so tested were

eligible. About 2,000 children were screened in 1973-74 for the Early Childhood Project.

Results

The longitudinal study reports upon essentially the same group of students at four different points in time (See Table 1). The large differences in "N" for the Metropolitan Readiness Test, May, 1972, are caused by the city-wide testing program in which all kindergarten children in Cincinnati participate. The results (Table 1) show that the children who attend preschool score significantly higher on the Boehm Test of Basic Concepts than those who do not attend. These differences are even greater at the end of kindergarten, on both the Boehm and the Metropolitan Readiness Test. Follow-up studies on samples of children from each group show that these differences are maintained at the end of both the first and second grade.

Table 1. Longitudinal Study, Preschool Through Second Grade, 1971-1974.

Treatment for 1970-1971	Tested September, 1971, Boehm (A)	Treatment for 1971-1972	Tested March, 1972, Boehm (B)	Tested May, 1972, Four Subtests of Metropolitan Readiness	Treatment for 1972-1973	Tested Reading Subtest, Metropolitan September, 1973	Treatment for 1973-1974	Tested Reading Subtest, Metropolitan April, 1974
Attended Preschool	$\bar{X}$=23.8 Sd= 7.0 n=509	Attd. ADK	$\bar{X}$ = 34.5 Sd = 7.5 n = 472	$\bar{X}$ = 37.4 Sd = 13.7 n = 551	Attended First Grade in Title I Schools	$\bar{X}$ = 15.2 Sd = 5.7 n = 130	Attended Second Grade in Title I Schools	$\bar{X}$ = 26.0 Sd = 8.7 n = 130
Remained At Home	$\bar{X}$=21.0 Sd= 9.8 n=297 (sample)	Attd. ADK	$\bar{X}$ = 32.6 Sd = 7.6 n = 136					
		Attd. ½DK	$\bar{X}$ = 30.3 Sd = 2.3 n = 190 (sample)	$\bar{X}$ = 29.9 Sd = 13.3 n = 440		$\bar{X}$ = 13.8 Sd = 4.7 n = 333		$\bar{X}$ = 23.9 Sd = 8.9 n = 347
Tests of Significance and Probability	F=22.0 <.01		ADK vs. ½DK F = 101.83, <.001 ADK+PS vs. ADK w/o PS, F = 6.9, <.01			Separate Variance Estimate T Value -2.52 p = 0.013		Pooled Variance Estimate T Value -2.31 p = .021

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Additional preschool and all-day-kindergarten studies have been conducted over a period of six years (1968-1974) to satisfy annual federal and state program evaluation requirements. While these data have not been organized in such a way as to permit replications of the longitudinal study, the individual comparisons for particular years support the interpretations in the longitudinal study.

One such study used the Peabody Picture Vocabulary Test (PPVT), which was administered by a professional team during September, 1972 and May, 1973 to a stratified random sample of 98 preschool, 71 half-day-kindergarten ($\frac{1}{2}$DK), and 88 all-day-kindergarten (ADK) students in 21 schools. The average I.Q. scores on the PPVT rose from 71 to 83 for the preschool group, from 72 to 82 for the $\frac{1}{2}$DK, and from 84 to 91 for the ADK group. Virtually all of the ADK students had attended preschool the previous year while virtually none of the $\frac{1}{2}$DK students had any prior school experience. Table 2 contains the summary data.

The major problem in interpreting these results is the absence of pretest information on the groups before they entered preschool. The social intervention criteria for entering into the program, apparent need, is strengthened somewhat by the higher percentages of siblings of older Title I children in the program. However, we have only indirect evidence that entrants into the preschool program were initially comparable to those who enter school later.

Evidence from the 1973-74 school year (Table 3), after pretesting was initiated to screen program entrants, shows that children who initially score lower (below stanine 4) on the Cooperative Preschool Inventory, score significantly higher than the rejectees (above stanine 4) after one year in the preschool program. It is, therefore, plausible that the initial

differences in Table 1 are the results of treatment and not selection bias. Longitudinal study of the 1973-74 preschool cohort will be conducted to determine if the group maintains the differences recorded in preschool.

Table 2. Peabody Picture Vocabulary Test: Fall, 1972 (Form A); Spring, 1973 (Form B).

Group		Pre (Fall '72)	Post (Spring '73)
PPVT - PRESCHOOL			
$\bar{X}$	=	70.6	82.9
N	=	98	98
Sd	=	14.9	14.3
PPVT - ADK + PRESCHOOL			
$\bar{X}$	=	83.9	91.2
N	=	88	88
Sd	=	14.1	12.4
PPVT - $\frac{1}{2}$DK			
$\bar{X}$	=	72.4	82.1
N	=	71	71
Sd	=	15.7	14.1

Table 3. Summary Data for Cooperative Preschool Inventory; May, 1974. Preschool Enrolled vs. Ineligibles.

Item		Preschool Enrolled (Scored at or below third stanine in '73)	Ineligible (Not in Preschool because they scored above 3rd stanine in '73)
$\bar{X}$	=	33.2	24.6
N	=	684	173
Sd	=	9.4	10.9

Discussion

The results documented in this report were not collected as part of a planned research study; subjects were not randomly assigned, in some cases, initial status data were not collected, and populations were subject to uncontrolled mortality.

On the positive side, the results have been replicated on different cohorts for at least three years. These results suggest that preschool and kindergarten have a significantly positive affect on both intelligence and readiness test scores.

Further, the evidence suggests that these gains are maintained until the end of the second grade. Results for populations with varying amounts of pre-first grade schooling suggest that there is a positive and lasting relationship between the amount of time students participate in preschool and kindergarten, and their performance on tests.

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